Molecular characterization of *Hymenolepis nana* based on nuclear rDNA ITS2 gene marker

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Abstract

Introduction: *Hymenolepis nana* is a zoonotic tapeworm with widespread distribution. The goal of the present study was to identify the parasite in the specimens collected from NorthWestern regions of Iran using PCR-sequencing method.

Methods: A total of 1521 stool samples were collected from the study individuals. Initially, the identification of hymenolepis nana was confirmed by parasitological method including direct wet-mount and formalin-ethyl acetate concentration methods. Afterward, PCR-sequencing analysis of ribosomal ITS2 fragment was targeted to investigate the molecular identification of the parasite.

Results: Overall, 0.65% (10/1521) of the isolates were contaminated with *H. nana* in formalin-ethyl acetate concentration. All ten isolates were succefully amplified by PCR and further sequenced. The determined sequences were deposited in GenBank under the accession numbers MH337810 -MH337819.

Conclusion: Our results clarified the presence of *H. nana* among the patients in the study areas. In addition, the molecular technique could be accessible when the human eggs are the only sources available to identify and diagnose the parasite.

Keywords: *Hymenolepis nana*, rDNAITS2, PCR, Iran.

DOI: https://dx.doi.org/10.4314/ahs.v19i1.6

Cite as: *Shahnazi M, Mehrizi MZ, Alizadeh SA, Heydarian P, Saraei M, Alipour M, Hajialilo E. Molecular characterization of Hymenolepis nana (Cestoda: Cyclophyllidea: Hymenolepididae) based on nuclear rDNA ITS2 gene marker. Afri Health Sci. 2019;19(1): 1346- 1352. https://dx.doi.org/10.4314/ahs.v19i1.6*

Introduction

Hymenolepis nana, generally known as the dwarf tapeworm, is one of the most common tapeworms of humans and rodents, in which the parasite can cause hymenolepiasis. This zoonotic tapeworm has a cosmopolitan distribution with socio-economic and medical significance which may occur in many countries, worldwide[1,2]. The parasite is among the neglected tropical diseases (NTD). Human hymenolepiasis caused by one of two adult tapeworms *Hymenolepis diminuta* or *Hymenolepis nana*, is a globally widespread zoonotic infection known to be endemic in Asia, Southern and Eastern Europe, Central and South America, and Africa[3,4,5]. *H. nana*, however, accounts for the most common cause of all cestode infections in humans and in temperate zones with high incidence in children and institutionalized groups[6,7]. Although the extent of clinical manifestations depends on the worm burden yet the infection with *H. nana* usually causes many clinical symptoms such as headache, weakness, anorexia, abdominal pain, and diarrhea[8]. Infection is usually self-cleared by adolescence and is infrequent in healthy adults[7]. The drug of choice to treat hymenolepiasis is praziquantel which is more effective than other drugs including mebendazole or niclosamide[9].

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